

Appendix B – Pending Claims

Application No. 09/851,287

1. A laser noise control system operating in conjunction with a laser driver so as to control a laser, the laser noise control system comprising:

an optical sensor positioned to receive a portion of a light signal generated by the laser, the optical sensor thus capable of producing a signal indicative of the laser beam generated by the laser; and

a noise reduction feedback network operatively connected to the optical sensor and to the laser, the noise reduction feedback network configured to include a filter circuit so as to produce a filtered noise reduction signal which is provided to the laser for combination with a laser driver signal produced by the laser driver.

2. The low noise laser control system of claim 1 further comprising a LF control loop operatively attached between the optical sensor and the laser driver to provide CW control of the laser.

3. The low noise laser control system of claim 2 further comprising a trans-impedance amplifier attached to an output of the optical sensor, the trans-impedance amplifier producing an amplified signal proportional to the optical sensor signal and providing the amplified signal to both the LF control loop and the noise reduction feedback network.

4. The low noise laser control system of claim 1 wherein the noise reduction feedback network is a series RCL circuit.

5. The low noise laser control system of claim 4 wherein the RCL circuit is configured to provide a band-pass function.

6. The low noise laser control system of claim 1 wherein the noise reduction feedback network is a high-pass transistor amplifier network.

7. The low noise laser control system of claim 3 wherein the LF control loop includes a processor attached to the trans-impedance amplifier, the processor further having an output attached to the laser driver, the processor output carrying a LF control signal which allows the laser driver to provide appropriate levels of current to operate the laser at a desired CW level.

8. The low noise laser control system of claim 7 wherein the noise reduction feedback network is a series RCL circuit.

9. The low noise laser control system of claim 7 wherein the noise reduction feedback network is a high-pass transistor amplifier network.

10. The low noise laser control system of claim 3 wherein the LF control loop includes an amplifier network attached to the output of the trans-impedance amplifier, the amplifier having an output attached to the laser driver, the amplifier output carrying a LF control signal which allows the laser driver to provide appropriate levels of current to operate the laser at a desired CW level.

11. The low noise laser control system of claim 1 further comprising a control switch to selectively operate the noise reduction feedback network.

12. A low noise laser control system for use in controlling a laser within a data storage drive, comprising:

- an optical sensor associated with the laser to produce a sensor signal indicative of the laser beam being produced by the laser and directed toward a storage media;
- an amplifier attached to an output of the optical sensor for producing an amplified signal which is inverted with respect to the sensor signal;
- a noise reduction feedback network having a circuit connection between the amplifier and the laser in order to receive the amplified signal and to provide a filtered noise signal to the laser, wherein the filtered noise signal will cancel noise present on the laser beam.

13. The control system of claim 12 wherein the noise reduction feedback network is a high pass high impedance network.

14. The control system of claim 12 wherein the noise reduction feedback network comprises a resistor, a capacitor, and an inductor all connected in series with one another.

15. The control system of claim 12 wherein the noise reduction feedback network comprises a transistor amplifier.

16. The control system of claim 12 wherein the optical sensor is a fast forward sense detector.

17. The low noise laser control system of claim 12 further comprising a control switch to selectively operate the noise reduction feedback network.

18. The control system of claim 12 wherein the noise reduction feedback network further comprises a disabling switch for tuning selectively disabling the feedback network.

19. The control system of claim 18 wherein the feedback network is disabled during writing operations of the data storage drive.

20. A laser control system attached to the read/write laser of an optical data storage system which is directed toward a data storage medium, the control system comprising:

a laser driver attached to the laser for providing a laser drive signal which controls the operation of the laser;

an optical sensor coupled to the laser to receive a portion of the laser signal produced by the laser and provide a sensor output proportional to the power of the laser signal;

an amplifier attached to the optical sensor for producing an amplified signal, the amplified signal being inverted and amplified when compared with the sensor output;

a processor attached to the amplifier and the laser driver, the processor receiving the amplified signal and producing a laser control signal to control the intensity level of the laser; and

a noise reduction feedback network having a circuit connection between the output of the amplifier and the laser, the noise reduction feedback network receiving the amplified signal and providing a cancellation signal to reduce the noise in the laser signal directed to the optical medium.

21. The laser control system of claim 20 further comprising a switch operatively connected to the noise reduction feedback network to provide for selective generation of the cancellation signal.

22. The laser control system of claim 20 wherein the noise reduction feedback network is a high pass and high impedance network.

23. The laser control system of claim 20 wherein the noise reduction feedback network comprises a resistor, a capacitor, and an inductor all connected in series with one another.

24. The laser control system of claim 23 wherein the resistor, capacitor and inductor are configured to provide a band-pass function.

25. The laser control system of claim 20 wherein the noise reduction feedback network comprises a transistor amplifier.

26. The laser control system of claim 20 wherein the optical sensor is a fast forward sense detector.

27. A laser control system for operating a laser, comprising:
an optical sensor positioned to receive a portion of an optical signal produced by the laser, the optical sensor thus producing a sensor signal responsive to the optical signal; and

noise reduction means for receiving the sensor signal from the optical sensor and producing a noise reduction signal which is then provided to the laser to cancel noise present in the laser.

28. The laser control system of claim 27 wherein the noise reduction means is a feedback network.

29. The low noise laser control system of claim 27 further comprising a LF control means operatively attached between the laser and the optical sensor to provide CW control of the laser.

30. The low noise laser control system of claim 29 further comprising a trans-impedance amplifier attached to an output of the optical sensor, the trans-impedance amplifier producing an amplified signal proportional to the optical sensor signal and providing the amplified signal to both the LF control means and the noise reduction means.

31. The low noise laser control system of claim 29 wherein the noise reduction means is a band pass filter.

32. A laser noise reduction system for use in conjunction with a laser which is driven by a laser driver, the laser noise reduction system comprising:

an optical sensor positioned to receive a portion of the laser beam generated by the laser and to produce a sensor signal indicative of the laser beam;

a noise reduction feedback circuit having an input connected to the optical sensor so as to receive the sensor signal and an output connected to the laser, the noise reduction feedback circuit having filtering circuitry and inversion circuitry such that a noise reduction signal is generated at the output which is an inverted and filtered version of the sensor signal.

33. The laser noise reduction system of claim 32 wherein the noise reduction feedback circuit is a series RCL circuit.

34. The low noise laser control system of claim 32 wherein the RCL circuit is configured to provide a band-pass function.

35. The low noise laser control system of claim 32 wherein the noise reduction feedback network is a high-pass transistor amplifier network.

36. The low noise laser control system of claim 32 further including an LF control loop including a processor attached to a trans-impedance amplifier, the processor further having an output attached to the laser driver, the processor output carrying a LF control signal which allows the laser driver to provide appropriate levels of current to operate the laser at a desired CW level.

37. The low noise laser control system of claim 36 wherein the noise reduction feedback circuit is a series RCL circuit.

38. The low noise laser control system of claim 36 wherein the noise reduction feedback circuit is a high-pass transistor amplifier network.

39. The low noise laser control system of claim 32 further comprising a control switch to selectively operate the noise reduction feedback network.